

**SIEMENS**







# Siemens Wind Power Division

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EKF  
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## Siemens Global Structure

| Sectors   |                         | Divisions  |   |
|---|-------------------------|--|---|
|    | Industry                | <ul style="list-style-type: none"> <li>Industry automation</li> <li>Drive technologies</li> <li>Customer service</li> </ul>    |   |
|    | Energy                  | <ul style="list-style-type: none"> <li>Oil &amp; gas</li> <li>Fossil power generation</li> <li>Wind power</li> </ul>           | <ul style="list-style-type: none"> <li>Energy service</li> <li>Power transmission</li> <li>Solar and hydro</li> </ul> |
|   | Healthcare              | <ul style="list-style-type: none"> <li>Imaging and therapy systems</li> <li>Customer solutions</li> <li>Diagnostics</li> </ul> | <ul style="list-style-type: none"> <li>Clinical products</li> </ul>   |
|  | Infrastructure & Cities | <ul style="list-style-type: none"> <li>Rail systems</li> <li>Mobility and logistics</li> <li>Low and medium voltage</li> </ul> | <ul style="list-style-type: none"> <li>Smart grid</li> <li>Building technologies</li> <li>OSRAM</li> </ul>            |

## Siemens Energy Sector

### Products and Systems in 6 Divisions

**Oil & Gas**



**Fossil Power Generation**



**Wind Power**



**Solar & Hydro**



**Energy Service**



**Power Transmission**



## Siemens Wind Power Facts at a glance

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### Siemens Wind Power facts

One of the world's leading suppliers of wind power solutions

Acquired Danish wind turbine manufacturer Bonus Energy A/S in 2004

Installed Base: > 10,600 turbines with > 15,800 MW capacity<sup>1)</sup>

Installed: > 2,900 MW in 2011

More than 8,000 employees globally

Record order backlog of ~ € 12 billion incl. service

Revenue in 2011: ~ € 3,9 billion<sup>2)</sup>

1) Dec 2011 2) consolidated on Renewable Energy Division level

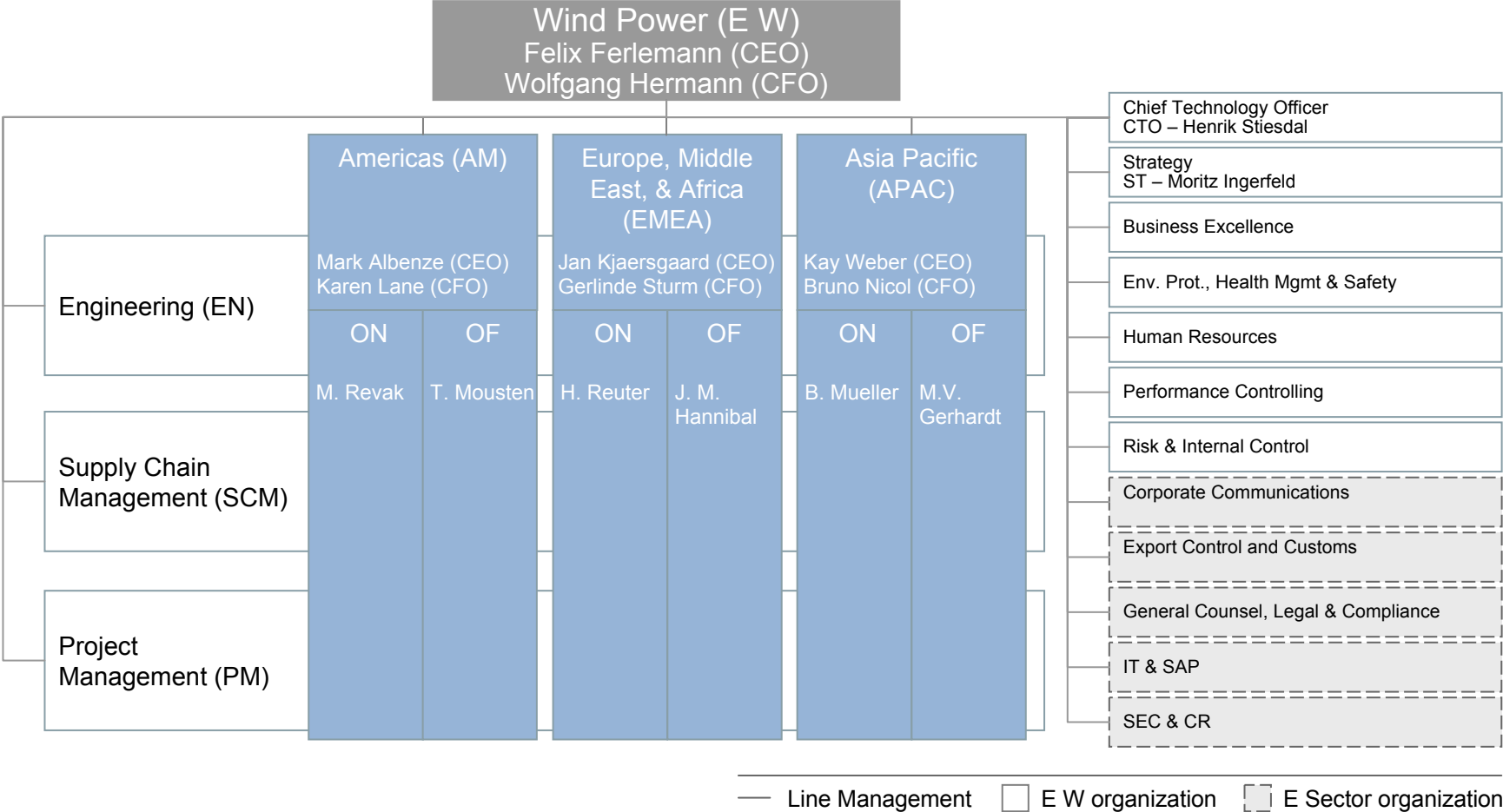
## Siemens Wind Power is on track for further growth

- ✓ **Clear No. 1 in Offshore**
  - Major German orders (Borkum Riffgrund II, Meerwind)
  - Alliance with Scottish Southern Energy for UK round 3
- ✓ **Enel Green Power onshore order of 1.2 GW frame contract**
- ✓ **New direct drive turbines with 50% less moving parts and significant weight reduction**
  - SWT 6.0 next generation offshore turbine prototype installed in Høvsøre, Denmark
  - SWT 2.3-113 for low to medium wind speeds
- ✓ **> DKK 1 billion investment initiated in Denmark**



# Division structure reflects importance of three Business Units and Global Functions

Organizational structure for E W



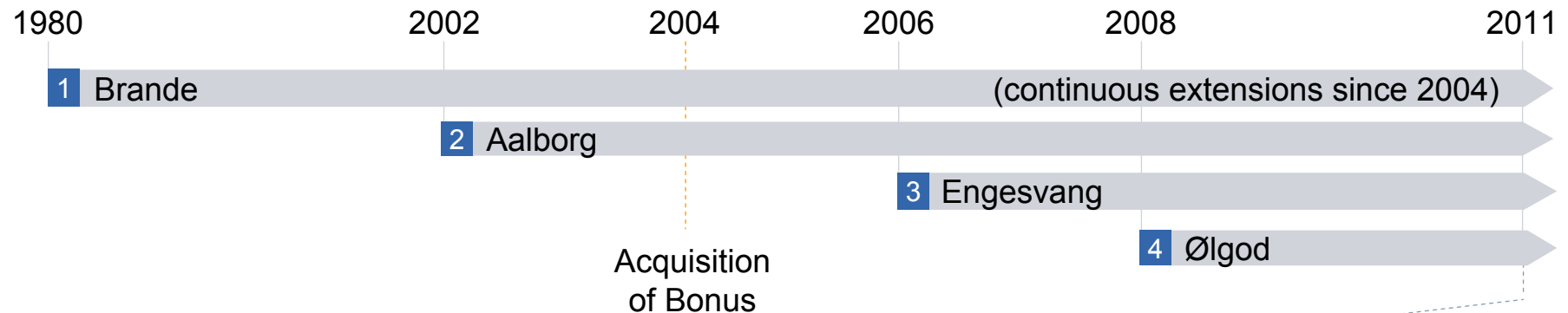
## Siemens Wind Power – a global player

But Denmark is still the hotspot of the global wind industry.

- 
- In 2011 alone, we have created more than 1000 jobs in Denmark
  - 150 new positions are still scheduled to be created this year
  - 1 billion DKK investments in R&D test facilities in Denmark are under way

## Continuous investment in Denmark

### Development of Siemens Denmark facilities



| 1 | Brande  |
|---|---|
| ▪ | Nacelle production, R&D, headquarters                         |
| ▪ | 3,700 employees   |
| ▪ | 86,000 m <sup>2</sup> under roof, 460,000 m <sup>2</sup> land |

| 2 | Aalborg   |
|---|---|
| ▪ | Blade production  |
| ▪ | 1,100 employees   |
| ▪ | 71,000 m <sup>2</sup> under roof, 350,000 m <sup>2</sup> land |

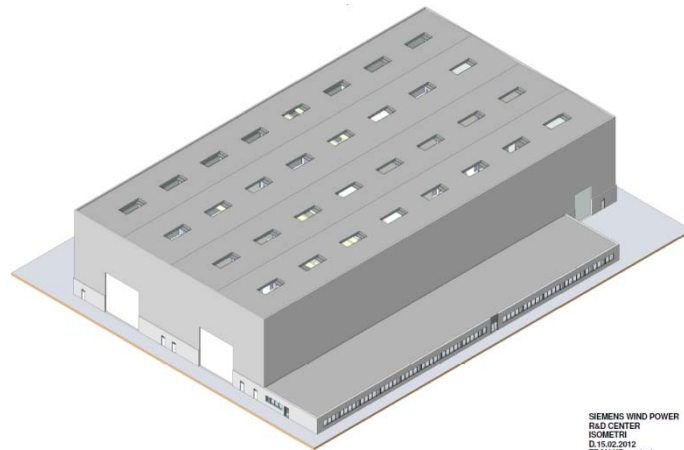
| 3 | Engesvang   |
|---|---|
| ▪ | Blade production  |
| ▪ | 300 employees   |
| ▪ | 16,000 m <sup>2</sup> under roof, 140,000 m <sup>2</sup> land |

| 4 | Ølgod   |
|---|---|
| ▪ | Hub production  |
| ▪ | 100 employees   |
| ▪ | 7,500 m <sup>2</sup> under roof, 34,500 m <sup>2</sup> land |



## Groundbreaking of new test center, March 6<sup>th</sup> 2012

- CTO Henrik Stiesdal broke the ground for the new R&D test center in Brande on March 6th.
- The 8,000 sqm. building is expected to be finished by summer.
- The facility, with a height of 22 m, will house prototype production, component testing, laboratories and warehousing



SIEMENS WIND POWER  
R&D CENTER  
ISOMETRI  
01.03.2012  
TEGN NR. 1.0/00



## We continue with our strategy

4 | strategy

### Innovation

Key success factor to bring down costs and differentiate Siemens from its competitors

### Industrialization

Key lever to make wind power affordable and position Siemens as key enabler for energy change

Making  
Wind Power competitive  
with conventional energy  
sources

Maintaining leading  
position in wind

Securing technology  
leadership

### Internationalization

Drives local accessibility, strengthens regional commitment and gets Siemens close to its customer

### Intensified customer ties

Enables progress in projects and technology while deepening customer relations

## Continuous investment into new technology resulted in groundbreaking direct drive turbines

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### Innovation - Siemens direct drive technology

- Introduction of new SWT-3.0-101 direct drive wind turbine in April 2010 and the SWT-2.3-113 direct drive wind turbine in March 2011
- Direct drive technology with no gearbox
- Simplified design with 50% less parts than in equivalent geared design
- More power with compact design
- Minimizes the cost of energy



# Siemens SWT-6.0-154: The next generation offshore wind turbine

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## Innovation - SWT-6.0-154

- Direct drive technology with permanent magnet generator and a 154 m rotor offers superior performance and efficiency.
- Optimized nacelle layout for excellent serviceability; with the highest degree of safety and quality in mind.
- Proven technology, redundancy in critical components and rigorous testing for maximized reliability.
- New low-weight standard for offshore wind turbines offering significant cost benefits throughout the entire value chain.
- Industrialization in manufacturing, quality assurance and installation, significantly shortening commissioning time for faster project hand-over.



Prototype installed in Høvsøre Denmark: SWT-6.0-120

# Proven IntegralBlade® technology eliminates glue joints and ensures blade strength

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Technology: IntegralBlade®

- IntegralBlade® technology is a closed manufacturing process invented by Siemens offering high quality in an optimal working environment.
- One-shot manufacturing process eliminating the presence of glue joints in the blade for a robust design.
- The IntegralBlade® process is based on vacuum-assisted resin transfer molding.
- The blade is not gel coated as part of the manufacturing process, making it possible to visually inspect the blade to ensure high quality.



## From Bonus to the new assembly line

### Industrialization - Brande facilities and 2.3 nacelle production



2004

- Production:  
3 x 2.3 MW nacelles per week
- 36 h per turbine



2011

- Production Capacity:  
40 x 2.3 MW nacelles per week
- 17.5 h per turbine

## Market leader in offshore with > 2 GW installed\*

**Burbo Banks, UK**  
→ 25 x SWT-3.6-107 (2007)

**Lynn / Inner Dowsing, UK**  
→ 54 x SWT-3.6-107 (2008)

**Gunfleet Sands, UK**  
→ 48 x SWT-3.6-107 (2009)

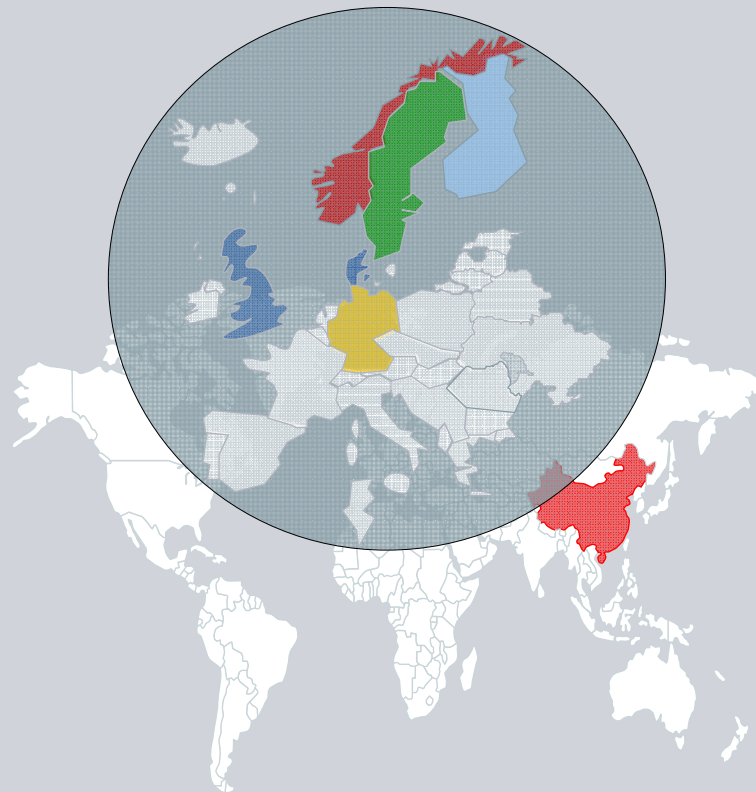
**Rhyl Flats, UK**  
→ 25 x SWT-3.6-107 (2009)

**Walney, UK**  
→ 51 x SWT-3.6-107  
→ 51 x SWT-3.6-120

**Pori, FIN**  
→ 1 x SWT-2.3-101 (2010)

**Baltic I, DE**  
→ 21 x SWT-2.3-93 (2010)

**Rudong Intertidal, CHN**  
→ 21 x SWT-2.3-101



**Vindeby, DK**  
→ 11 x 0.45 MW (1991)

**Middelgrunden, DK**  
→ 20 x SWT-2.0-76 (2000)

**Samsø, DK**  
→ 10 x SWT-2.3-82 (2002)

**Rønland, DK**  
→ 4 x SWT-2.3-93 (2002)

**Rødsand/Nysted, DK**  
→ 72 x SWT-2.3-82 (2003)

**Frederikshavn, DK**  
→ 1 x SWT-2.3-82 (2003)

**Horns Rev II, DK**  
→ 91 x SWT-2.3-93 (2009)

**Rødsand II, DK**  
→ 90 x SWT-2.3-93 (2010)

**Lillgrund, SE**  
→ 48 x SWT-2.3-93 (2007)

**Hywind, NO**  
→ 1 x SWT-2.3-82 (2009)

\*commissioned

## Many projects under installation and to come...

### Greater Gabbard, UK

→ 140 x SWT-3.6-107

### Sheringham Shoal, UK

→ 88 x SWT-3.6-107

### London Array, UK

→ 175 SWT-3.6-120

### Lincs, UK

→ 75 x SWT-3.6-120

### Gwynt Y Mor, UK

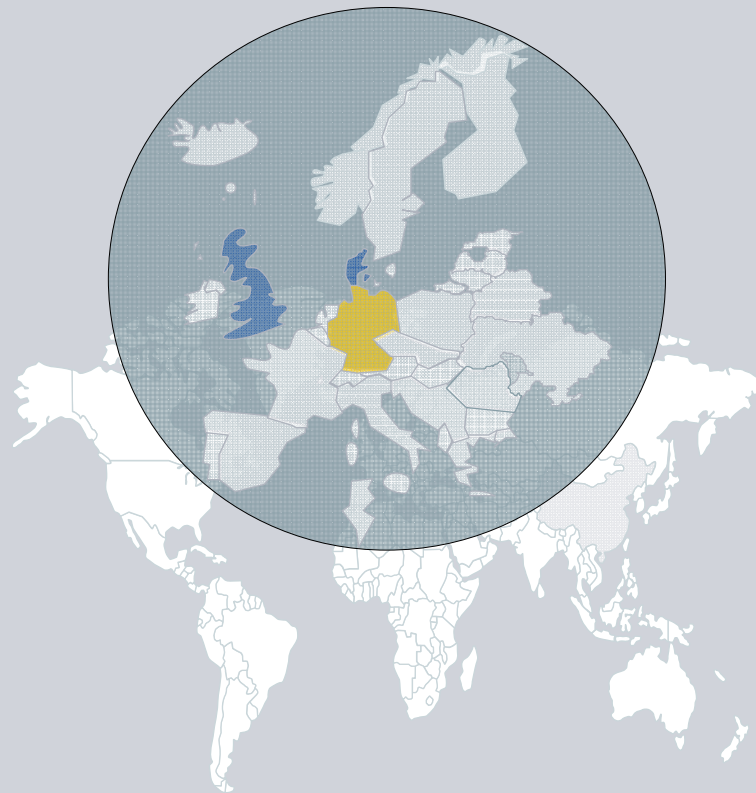
→ 160 x SWT-3.6-107

### West of Duddon Sands, UK

→ 108 x SWT-3.6-120

### Teesside, UK

→ 27 x SWT-2.3-93



### Anholt, DK

→ 111 x SWT-3.6-120

### Baltic 2, DE

→ 80 x SWT-3.6-120

### Borkum Riffgat, DE

→ 30 x SWT-3.6-107

### DanTysk, DE

→ 80 x SWT-3.6-120

### Borkum Riffgrund 1+2, DE

→ 178 x SWT-3.6-120

### Meerwind Süd Ost, DE

→ 80 x SWT-3.6-120

### Amrumbank West, DE

→ 80 x SWT-3.6-120



## Siemens is also growing strong in onshore wind

- In FY 2011, onshore projects accounted for 70% of the wind power revenue
- Siemens is particularly strong in the large U.S. market and other key markets
- Siemens is
  - No. 1 in the UK
  - No. 3 in the U.S.
  - No. 2 in Canada



## EKF – an essential and reliable partner

- ✓ EKF support is essential for the market entrance of new technologies, e.g. direct drive turbines, new tower concepts, new & larger blades
- ✓ EKF is key partner for financing in Siemens Wind Power's key / growth markets
  - Onshore: in Europe (e.g. Turkey) and many other growth markets (e.g. Africa & Asia Pacific)
  - Offshore: investors increasingly seeking project finance incl. construction phase which is still extremely challenging; increasing project size & missing proper syndication market; high capital needs necessary to realize the multitude of future projects
- ✓ EKF is the premier ECA when it comes to Offshore Wind Financing (strong track record)



## EKF – an excellent relationship

- ✓ First two Siemens Wind Power projects with EKF participation have been closed in 2004 (Norway, Statkraft AS) and 2006 (Sweden, Vattenfall AB)
- ✓ Siemens leading market share and #1 in offshore orders coupled with the strong growth and high capital needs have strengthened our relationship with EKF
- ✓ Meanwhile, the total exposure involving Siemens Wind Power is of today > EUR 700'. A significant number of transactions is in the pipeline (~ EUR 1.500')
- ✓ EKF has of today supported Siemens in installing more than 1,500 MW world wide
- ✓ A substantial EKF contribution (volume-wise) is a significant part of today's offshore financing structures



## EKF – project example

### Meerwind 288 MW Offshore Wind Farm

Country: Germany  
 Sponsor: Blackstone (80%)  
 Financial Close: 08/2011  
 Expected Take Over: Q1/2014



#### Project & financing key facts

- Location: ~23 km NW of the island of Helgoland, North Sea
- Installed capacity: 288 MW
- Scope of Supply: 80 x SWT 3.6 – 120
- Total investment: ~EUR 1,200'
- Financial Advisors: KfW IPEX, Dexia Bank & Green Giraffe
- Total debt financing: ~EUR 820'
- EKF's share (guarantee) of total debt is ~30%

#### Project highlights

- Germany's largest fully financed Offshore Wind Farm including construction phase
- First offshore wind project to reach financial close under the KfW 5'' offshore program
- Will provide green electricity for more than 400,000 homes in Germany

## How EKF can support our growth endeavors

- ✓ Ensuring competitive financial terms & conditions (staying competitive towards i.e. Euler, Hermes and KfW)
- ✓ Support in challenging countries (e.g. Greece, CEE & African countries)
- ✓ Support for projects with new technology (DD machines/ new tower concepts/ new and larger blades)



**Thank you very much for your attention!**

